PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Jean-Yves LAURENT et al. Attn: PCT Branch

Application No. New U.S. National Stage of PCT/FR04/001525

Filed: December 13, 2005 Docket No.: 126303

For: FUEL CELL IN WHICH A FLUID CIRCULATES ESSENTIALLY PARALLEL TO THE ELECTROLYTIC MEMBRANE AND METHOD FOR PRODUCTION OF SUCH A FUEL CELL

TRANSLATION OF THE ANNEXES TO THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a translation of the annexes to the International Preliminary Examination Report (Form PCT/IPEA/409). The attached translated material replaces the claims and abstract.

Respectfully submitted,

William P. Berridge
Registration No. 30,024

Joel S. Armstrong
Registration No. 36,430

WPB:JSA/mps

Date: December 13, 2005

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

Claims

1. Fuel cell comprising a substrate (2) supporting an electrolytic membrane (4) comprising first and second faces (4a, 4b) on which first and second electrodes are respectively arranged, the first and second electrodes respectively comprising first and second catalytic elements, circulation means being designed to bring first and second fluids respectively in proximity to the first and second catalytic elements, fuel cell characterized in that the circulation means of the first fluid are designed in such a way as to make the latter flow in a direction substantially parallel to the first face (4a) of the electrolytic membrane (4), in a cavity formed in the substrate (2) and comprising a plurality of studs (11) supporting said electrolytic membrane (4).

2. Fuel cell according to claim 1, characterized in that the distance between two studs (11) is less than or equal to 50 micrometers.

3. Fuel cell according to one of the claims 1 and 2, characterized in that the first catalytic element is formed by a plurality of catalytic zones (17) respectively arranged at the top of the studs (11) of the cavity (10).

4. Fuel cell according to one of the claims 1 and 2, characterized in that the first catalytic element is formed by a plurality of catalytic zones (17), said catalytic zones (17) being respectively formed by the studs (11).

5. Fuel cell according to claim 4, characterized in that the studs (11) comprise, at the top part thereof, a broader zone forming a head (28).

6. Fuel cell according to any one of the claims 1 to 4, characterized in that the studs (11) have a circular cross-section.

7. Fuel cell according to any one of the claims 1 to 4, characterized in that the studs (11) have a rectangular cross-section.

8. Fuel cell according to any one of the claims 1 to 7, characterized in that the studs (11) have a polygonal cross-section.

9. Fuel cell according to any one of the claims 1 to 8, characterized in that the studs (11) form a network designed to distribute the first fluid homogeneously in the cavity (10).

10. Fuel cell according to claim 9, characterized in that the network is arranged in zig-zagged manner.

11. Method for production of a fuel cell according to any one of the claims 1 to 3, characterized in that it consists in performing reactive ionic etching in the substrate (2) so as to simultaneously form the cavity (10) and the plurality of studs (11).

12. Method for production according to claim 11, characterized in that it consists in depositing on the top of each stud (11), by physical vapour deposition, a growth promoting substance (23) designed to foster formation of a catalyzer support (24) whereon a catalytic layer (25) is deposited by electroplating.

13. Method for production according to claim 12, characterized in that the catalyzer support (24) is formed by carbon nanotubes.

14. Method for production of a fuel cell according to one of the claims 1, 2 and 4, characterized in that it consists in etching the cavity (10) in the substrate (2) and in then forming the plurality of studs (11) by electrolytic growth.